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# Is Financial Innovation Good for the Economy?\*

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## Executive Summary

There has been a great deal of financial innovation in recent decades but its social value is unclear. In the run-up to 2008, banks took large amounts of risk relative to the size of the economy. This approach was made possible by and sometimes justified in terms of “innovation.” But it also created a great deal of downside risk for the economy—including widespread job losses and a big increase in the fiscal deficit.

Innovation is among the most powerful forces that shape human society. The improvements in the material standard of living enjoyed by most (though not all) Americans are largely due to innovation. One of the principal arguments for free-market capitalism is that it is the economic system that most encourages innovation, because it allows innovators to capture a significant part of the benefits of their work.

Today, financial innovation stands accused of being complicit in the financial crisis that has created the first global recession in decades. (See, e.g., Johnson and Kwak 2010, 105–9). The very innovations that were celebrated by former Federal Reserve chairman Alan Greenspan earlier this decade—negative-amortization mortgages, collateralized debt obligations (CDOs) and synthetic CDOs, credit default swaps, and so forth—either amplified or caused the crisis, depending on your viewpoint.

However, the conventional wisdom is coalescing around the idea that financial innovation is basically good, but just needs to be watched a little more carefully. As Ben Bernanke said in a speech in May 2007: “We should also always keep in view the enormous economic benefits that flow from a healthy and innovative financial sector. The increasing sophistication and depth of financial markets promote economic growth by allocating capital where it can be most productive. The dispersion of risk more broadly across the financial system has, thus far, increased the resilience of the system and the economy to shocks. When proposing or implementing regulation, we must seek to preserve the benefits of financial innovation even as we address the risks that may accompany that innovation” (Bernanke 2007).

Intellectual conservatives and bankers have mounted a more fervent defense of financial innovation. Niall Ferguson (2009) argued recently, “We need to

remember that much financial innovation over the past 30 years was economically beneficial, and not just to the fat cats of Wall Street.”

But where is the evidence?

It may seem obvious that if innovation promotes economic growth, financial innovation must also promote economic growth. But that does not necessarily follow. To understand this, we need to think about what we mean by innovation and how recent—and likely future—financial innovations affect concentration and risk in our financial system.

The benefits of recent financial innovations have frequently been overstated. And to the extent that these innovations have encouraged or facilitated a high degree of leverage among very big institutions—and more devastating spills in the event that a big bank or other highly leveraged firm fails—we need to reassess potential and realized costs and risks.

## I. The Nature of Innovation

Take the computer industry, for example—an industry that has transformed the way many of us live and work. The computer industry has benefited from many types of innovation. There have been the invention of completely new products, such as the mouse and the graphical user interface; repeated innovation in manufacturing processes, such as Intel’s consistent ability to shrink the dimensions of chip manufacturing; innovation in distribution, such as Dell’s build-to-order process driven by customer configurations; innovation in design, such as the iPod, which didn’t do anything that MP3 players didn’t already do, but just did it better; and even innovations in the basic business model, such as the open source revolution that gave us Linux, Firefox, and many other mainstays of the software industry.

All of these innovations make it possible to do things that could not be done before (publish content that is immediately available to anyone in the world), or make it easier to do things (read newspapers from around the world), or make it cheaper to do things (make international phone calls).

Financial innovation is a different type of animal. Certainly the financial services industry has taken advantage of technological innovation; you can now access your financial statements and pay your bills online, for example. However, these innovations do not affect the core function of the financial sector, which is financial intermediation—moving funds from one place where they are not needed to another place where they are worth more.

The classic example of financial intermediation is the archetypal community savings bank. Ordinary people put their excess cash into savings accounts; the bank accumulates those deposits and loans out

as equivalent amount as mortgages (or commercial loans). Savers earn interest, homebuyers can buy homes without having to save for decades (or entrepreneurs can start or expand businesses), and the bank makes a profit on the spread—the difference between the interest paid to depositors and the interest charged to borrowers.

A principal purpose of financial innovation is to make financial intermediation happen where it would not have happened before. And that is what innovation has given us over the last thirty years. As Ferguson said, “New vehicles like hedge funds gave investors like pension funds and endowments vastly more to choose from than the time-honored choice among cash, bonds and stocks. Likewise, innovations like securitization lowered borrowing costs for most consumers” (2009).

However, there are two differences in how we should think about financial innovation as opposed to other forms of innovation.

## II. The Nature of Financial Innovation

First, in order for financial innovation to have a positive effect on financial intermediation, it must enable an economically productive usage of savings that would not otherwise occur. If a family is willing to pay \$300,000 for a new house that will cost \$250,000 to build (including land), and they can pay off a loan comfortably over 30 years, then buying a house is an economically productive usage of savers’ resources that would not occur if mortgages did not exist. But the financial innovation (a mortgage) does not make the world better in and of itself; it depends on someone else’s having found a useful way to employ financial resources.

Second, financial intermediation creates value when it moves funds to places where they are more valuable—making credit more available. But it is possible for the economy to be in a state where anyone who can employ credit effectively already has access to credit—or where people arguably have too much access to credit.

With the benefit of hindsight, it is easy to see that the U.S. housing sector passed this point earlier this decade. With negative-amortization mortgages (where the monthly payment was less than the interest, causing the principal to go up) and stated-income loans (where the loan originator did not verify the borrower’s income), virtually anyone could buy a new house—leading developers to build tens of thousands of now empty houses, their current value far less than their cost of construction. In short, excess financial intermediation can destroy value when it causes people to make investments with negative returns; in that case,

the banks would have been better off taking their deposits and investing them in Treasury bills.

So in evaluating financial innovation, we need to think about whether it promotes beneficial financial intermediation or excessive and destructive financial intermediation. We cannot say that innovation is “good” simply because there is a market for it. The fact that there was a market for new houses does not change the fact that building those houses has turned out to be a destructive use of capital.

### III. Evaluating Innovations

In the early 1970s, Mohammed Yunus lent \$27 to 42 female basket weavers in a village in Bangladesh; they repaid the loan, with interest, from the proceeds of their sales. In 1976, he founded Grameen Bank to make small loans to poor villagers, often to fund start-up costs for small ventures (*Daily Star* 2006). Grameen Bank was the first modern provider of microcredit, which has since spread throughout the developing world. Yunus’s innovation was recognizing that poor people could be good borrowers but were ignored by a traditional banking sector that refused to or was unable to serve them. In other words, he found an economically productive usage of savings that was not otherwise occurring.

How does recent financial innovation in the developed world compare?

For Ben Bernanke, the balance is mostly positive, as he said in an April 2009 speech: “I don’t think anyone wants to go back to the 1970s. Financial innovation has improved access to credit, reduced costs, and increased choice. We should not attempt to impose restrictions on credit providers so onerous that they prevent the development of new products and services in the future” (Bernanke 2009).

Ryan Avent, however, noticed that Bernanke did not name a beneficial financial innovation that was more recent than the 1970s: “His examples of successful financial products? Credit cards, for one, which date from the 1950s. Policies facilitating the flow of credit to lower income borrowers was another, for which he credited the Community Reinvestment Act of 1977. And, of course, securitization and the secondary mortgage markets developed by Fannie Mae and Freddie Mac in ... the 1970s” (Avent 2009).

Both Bernanke and Ferguson rely on securitization as a central example of a beneficial innovation. Securitization probably was beneficial on balance, because it expanded the pool of funds available for lending; also, securitization on its own—before the new products of the late

1990s and 2000s—did not produce the colossal boom and bust we have just lived through. But it is those newer products that the defenders of innovation are more hesitant to talk about.

One of the paradigmatic products of the last 10 years was the collateralized debt obligation (CDO), in which a structurer combined a pool of bonds and sold off the cash flows from those bonds to investors. CDOs did promote financial intermediation; those initial bonds represent loans to real companies, and without the CDO market to absorb those bonds, those loans might never have been made in the first place. But the key issue is why investors were willing to absorb that risk.

The magic of a CDO, as explained by Coval, Jurek, and Stafford (2008), lies in how they can be used to manufacture “safe” bonds (according to credit rating agencies) out of risky ones—especially when CDOs are created out of CDOs, known as CDOs-squared. Investors as a group, were willing to buy CDOs when they would not have been willing to buy all the bonds that went into those CDOs, at least not without demanding a higher return. We do not have to decide who is to blame for this situation—the structurers who pushed these products, the credit rating agencies who blessed them, or the investors who didn’t study them thoroughly. The fact remains that at least some CDOs boosted financial intermediation by convincing investors to make investments they would not otherwise have made. These investments destroyed value and resulted in investors’ claiming that they were tricked (Duhigg and Dougherty 2008).

Another paradigmatic product was the credit default swap (CDS), which insured a bond (or a CDO) against the risk of default. Like CDOs, CDSs promoted financial intermediation; investors who might otherwise not have bought a given bond were willing to buy it, provided that they could buy a CDS for protection. Again, however, this worked only because at least one party did not fully appreciate the underlying risk profiles associated with these trades. CDSs were priced using models that underestimated the risk of default, because they were based on data from a time period with historically low default rates. As a result, the price of CDS protection was too low, and investors were essentially induced to buy financial products they might not have bought if the CDS had been priced in a way that fully accounted for their entire risk profile. The difference from the CDO example is that this time the losses were borne by the companies that underpriced the credit default swaps, such as AIG—and by the government, which had to bail out AIG. In any case, CDSs led directly to the misallocation of capital to value-destroying investments.

In short, CDOs and CDSs both promoted excessive financial intermediation by inducing investors to underestimate the risk of the investments they were making. As a result, funding flowed into value-destroying activities.

What about that other great example of financial innovation—venture capital? Venture capital (VC) did play an important role in stimulating technological innovation over the past 30 years, and despite its excesses it is a key part of the Silicon Valley miracle (see, e.g., Lerner and Schoar 2010).

But VC is not a recent innovation, and as far as financial products go, it is one of the simplest. VC funds are simply pools of money from large investors that are invested for long periods of time, where the profits return to the investors and the fund managers (the VC firms) take a cut. VC firms do lots of old-fashioned due diligence when selecting companies to invest in, and they make unleveraged equity investments in relatively simple securities. The preferred means of liquidating a VC investment, the initial public offering (IPO), likewise has changed little; indeed, the price of an IPO (the fee paid to investment banks) has managed to resist technological or any other form of innovation, remaining around 7% of the total IPO proceeds. What did change recently was the popularity of VC funds, and the predictable result was a glut of VC money, leading to excessive intermediation in the Internet boom, when funding flowed to many companies that ultimately did not succeed.

These are only a few of the forms that financial innovation has taken recently. It is fair to say that it is not obvious that the benefits have significantly outweighed the costs.

#### IV. Regulation Innovation

Once we start to think about costs, the financial regulatory system needs to take into account the peculiar nature of financial innovation. In particular, the incentives of the financial sector may be biased in favor of too much innovation. Despite the cartel-like pricing of IPOs (and debit cards),<sup>1</sup> the profitability of many other financial products has fallen with competition; the price for executing online stock trades, for example, is down around \$8 per transaction. The ongoing profitability of financial institutions depends on inventing and selling new financial products that are less commoditized and therefore command higher margins.

There may be a debate about who is to blame for the exotic and ultimately toxic financial products of the last decade—the buyers, the sellers,

or the abettors; but few investors woke up one morning thinking, “I wish I could buy a mezzanine tranche of a collateralized debt obligation backed by credit default swaps.” It is true that investors prefer a higher yield to a lower yield; but the school board of Whitefish Bay, Wisconsin, would never have taken \$35 million, leveraged up to \$200 million, and used the proceeds as collateral to sell CDS protection on a portfolio of corporate bonds—all to get a yield 0.9 percentage points higher than Treasury bonds—had the transaction not been manufactured by one bank and sold by another, as revealed by *Planet Money* and the *New York Times* (Duhigg and Dougherty 2008).

The Obama administration’s financial regulatory reform proposals, which became the Dodd-Frank legislation in the summer of 2010, in essence, said that regulation should be smarter and more modern. There will be a systemic risk regulator; more derivatives should be traded on exchanges and cleared by central counterparties; gaps in regulation should be closed; and so on.<sup>2</sup>

The current wave of regulatory reform follows the old conventional wisdom, which is that innovation is inherently good and regulators need only watch out for abnormal excesses or “bad apples.” However, these assumptions are brought into question when there is evidence that many instances of recent financial innovation have been very costly. A more balanced assessment of benefits and costs would involve regulators’ accounting for the increase in transaction costs, the ongoing costs of effective oversight, and the risk of unanticipated consequences.

As Arnoud Boot (2011) argues, innovation also adds complexity that can make it harder for managers to understand what subordinates are doing, for boards to supervise executives, and for outside investors to perceive what risks are really being taken. In a financial world where so many people are compensated on the basis of returns not adjusted for risk, there is great incentive to increase leverage and find other ways to increase recognized income in the upside scenario. By the time risks materialize, the decision makers in question may be long gone.

## V. Alternative Ways Forward

Instead of a regime where any product is allowed so long as it is sufficiently disclosed, a recent body of empirical evidence emphasizes the value of having a smaller range of products that are allowed to vary only along specific dimensions. For example, Adam Levitin (2008) has argued that all of the “innovation” in the credit card industry has simply been the invention of new, more complicated, and less transparent fee



structures, while the underlying product has remained the same for decades.

He proposes that regulation should standardize the terms of credit cards, so that charges cannot be hidden in fine print, and issuers should be allowed to compete on the interest rate, the annual fee, and the transaction fee. This change would ensure price competition, while making it harder for consumers to end up with dangerous products that encourage excessive borrowing. This model could be applied to a wider range of financial products—even to commercial products such as interest rate swaps and CDSs, which baffled a fair number of supposedly sophisticated players during the boom.

This is exactly the same broad philosophy that Elizabeth Warren proposes we should apply to consumer protection for financial products. She suggests that everything should be simplified and made more transparent. There may be a cost, in terms of reduced financial intermediation, and efforts to document and measure this should be welcomed. But, based on our assessment of recent financial history, it seems likely that these costs are small relative to the social benefits that would be associated with any such move toward requiring limits on complexity (Warren 2007).<sup>3</sup>

Second, these policies do not change the power balance that underlies regulation. The problem of regulatory capture has been well known for decades—the history is covered in Johnson and Kwak (2010). Large companies and industry groups gain influence over politicians through campaign contributions and other means; regulators become advocates for the companies they regulate, in some cases because they expect (accurately) to be hired by them when they leave government service. Unless this balance of power is changed, any new regulations are only good until the next boom, when the political winds will shift and the pressure will be to let the private sector make profits (because “a rising tide lifts all boats”).

The most direct approach to avoid regulatory capture would be to find ways to decrease the political influence of the financial sector and to increase the independence and prestige of the regulatory agencies. There is not yet hard and fast evidence on this point, but it seems likely that regulatory capture could become less prevalent if the barriers between lobbyists and politicians are increased, the salaries of rank-and-file regulators are increased, and the period before regulators are allowed to work in the industries they regulate are increased.

Meaningful restrictions on compensation, such as making bonuses in good years vulnerable to reduction in bad years, would also make the



financial sector less lucrative, less iconic, and ultimately less powerful. Some have argued that breaking up the largest banks and establishing size caps for financial institutions would not only reduce the “too big to fail” problem, but would reduce their political influence as well.<sup>4</sup>

Realistically, however, none of this is going to happen. All proposals along these lines were shot down during the Dodd-Frank financial reform debate. As a result we are left with a system that continues to innovate, as described above, while the biggest banks also become larger relative to the economy and more concentrated. This situation has serious implications for downside systemic risk.

## VI. Concentration in the Financial Sector

At the height of its power, in the run-up to the crisis of 2008, much of the influence of the financial sector was based on the fact that bankers were thought to be smart. “Financial innovation” was believed by many policy makers to be just as profound and just as conducive to productivity growth as the steam engine or the telephone had been in the nineteenth century.

Under the approving eye of regulators, big banks were allowed to become larger—and to take risks that were bigger relative to their balance sheets.

As a result of the financial-innovation-based boom and the crisis, the remaining big financial firms became bigger and remain very powerful politically. At the end of the fourth quarter of 2010, the six largest U.S. bank holding companies had assets valued at just over \$9 trillion, which was 63% of gross domestic product (GDP). This is up from around 55% of GDP before the crisis (e.g., 2006) and no more than 17% of GDP in 1995.

In the mid-1990s today’s six largest banks had assets around 20% of all banks insured by the Federal Deposit Insurance Corporation (FDIC). Today the size of these same banks, measured in the same way, is up to about 60%. At least roughly, this gives an indication of how the largest banks have risen in importance to the overall financial system—partly because of how financial innovation has played out.

With assets ranging from around \$800 billion to nearly \$2.5 trillion, these bank holding companies are perceived by the market as “too big to fail,” meaning that they are implicitly backed by the full faith and credit of the U.S. government. They can borrow more cheaply than their competitors and hence become larger.

Despite reform efforts since the crisis, including the Dodd-Frank legislation, big banks today still pose major structural system risks. Neil

Barofsky, the special inspector general for the Troubled Assets Relief Program (TARP) summarized the situation well in his January 2011 report, emphasizing “perhaps TARP’s most significant legacy, the moral hazard and potentially disastrous consequences associated with the continued existence of financial institutions that are ‘too big to fail’” (SIGTARP 2011, 5).

In public statements, top executives in these very large banks discuss their plans for further global expansion—presumably increasing their assets further while continuing to be highly leveraged. The next set of proposed innovations appears to be intensely cross-border in nature.

There may be important and significant risks associated with these expansions. A very large cross-border bank liquidation cannot be handled through ordinary bankruptcy or through the currently operating resolution mechanisms (see the discussion below). Nevertheless, this global banking strategy is endorsed or at least supported in public by senior leadership at the Treasury Department (Scheiber 2011).

## VII. Innovation and Capital Requirements

The post-Dodd-Frank debate on capital requirements is a good example of the problems that lie ahead and offers a striking example of the challenges that remain in designing a balanced regulatory regime toward financial innovation.

Nothing in the Basel III accord on capital requirements—concluded in fall 2010—directly addresses the core policy challenges. Recent research suggests that substantially raising capital requirements would not be costly from a social point of view. Specifically, Anat Admati and her colleagues argue that the social costs from much higher capital requirements would be essentially zero (Admati et al. 2010). Higher capital requirements would reduce the incentive for some of the most controversial kinds of financial innovation, which aim to increase effective leverage, that is, raise debt relative to equity. As equity is the buffer against insolvency, anything that increases capital will make individual institutions less prone to collapse and also reduce the probability that a single failure spreads across the financial system through any form of chain effect.

Such capital requirements need to be simple in order to be effective. Much “innovation” around the use of capital amounts to complex ways to disguise the fact that equity is lower—thus upside returns are higher, while downside risks also increase. Low levels of capital enhance systemic risk but when combined with standard “return on equity, unadjusted for risk” compensation schemes, the results can prove particularly toxic.

But instead the financial sector's view has prevailed—that raising capital requirements will slow economic growth. This argument finds support in industry-financed research (Institute of International Finance 2010); but it finds no support in any published research by independent analysts.

## VIII. Systemic Resolution

Instead of preventing banks from being too big to fail, Dodd-Frank gave regulators new resolution authority to protect the financial system from a collapsing financial institution in a crisis, hoping that fear of being “resolved” would be enough to deter financial institutions from taking excessive risks in the first place.

Though this authority offers a more systematic approach than before the legislation, it is highly improbable that authority granted to U.S. regulators over U.S. institutions will be sufficient if a major global bank with subsidiaries in many countries is about to fail. The bill also gives regulators new weapons they can use against big banks, if they so choose. These include the ability to set higher capital requirements for the largest, most important financial institutions, as well as the Kanjorski amendment, which allows regulators to force banks to shrink if they pose a risk to the financial system. But whether those weapons will ever be used remains a big question mark.

The FDIC recently established an 18-member Systemic Resolution Advisory Committee, with the goal of seeking outside opinions on how to prevent and, if necessary, handle the failure of large systemically important financial institutions. This committee met for the first time in June 2011 and it remains unclear how much impact it will have.<sup>5</sup>

One piece of the puzzle that is definitely missing is a systematic analytical framework for thinking about systemic risk. Under Dodd-Frank, the Office of Financial Research (OFR) is charged with carrying out research that would support policy thinking, including but not limited to systemic risk. But OFR, part of the Treasury Department, has had a slow start-up phase; after nearly a year, there is still no sign who will head it. The analytical basis for OFR work also remains completely a black box.

## IX. Macroeconomic Implications

Next time our innovative largest banks get into trouble, they may be beyond “too big to fail.” As seen recently in Ireland, banks that are very

big relative to an economy can become “too big to save”—meaning that while senior creditors may still receive full protection (so far in the Irish case), the fiscal costs overwhelm the government and push it to the brink of default.

The fiscal damage to the United States in that scenario would be immense, including through the effect of much higher long-term real interest rates. It remains to be seen whether the dollar could continue to be the world’s major reserve currency under such circumstances. The loss to our prestige, national security, and ability to influence the world in any positive way would presumably be commensurate.

To see the fiscal impact of the finance-induced recession, look at changes in the Congressional Budget Office’s baseline projections over time (CBO 2008, 2010).<sup>6</sup> In January 2008, the CBO projected that total government debt in private hands—the best measure of what the government owes—would fall to \$5.1 trillion by 2018 (23% of GDP). As of January 2010, the CBO projected that over the next 8 years debt would rise to \$13.7 trillion (over 65% of GDP)—a difference of \$8.6 trillion.

Most of this fiscal impact is not due to TARP—and definitely not due to the part of that program that injected capital into failing banks. Of the change in CBO baseline, 57% is due to decreased tax revenues resulting from the financial crisis and recession; 17% is due to increases in discretionary spending, some of it the stimulus package necessitated by the financial crisis (and because the “automatic stabilizers” in the United States are relatively weak); and another 14% is due to increased interest payments on the debt—because we now have more debt.<sup>7</sup> Most of the remaining increase is due to higher “mandatory spending,” but much of this is crisis-induced also, in the form of food stamps and income support programs.

In effect, a financial system with low capital levels and high leverage—hence prone to major collapses—creates a nontransparent contingent liability for the federal budget in the United States.

In 2007–8, our largest banks—with the structures they had lobbied for and built—brought us to the verge of disaster. TARP and other government actions helped avert the worst possible outcome, but only by providing unlimited and unconditional implicit guarantees to the core of our financial system. This can only lead to further instability in what the Bank of England refers to as a “doom loop” (Haldane and Alessandri 2009).

The crisis of 2007–9 amply demonstrated the risks of unchecked financial innovation. But our political establishment has not yet drawn

the necessary conclusion from this experience. Inventing the negative-amortization mortgage is not the same thing as inventing the hybrid engine; unless financial innovations overcome recognized, existing barriers to financial intermediation, there is no particular reason to think their benefits outweigh their costs and the risks they create. A better understanding of the costs and benefits of financial innovation is essential to protecting ourselves from the next financial crisis.

## Endnotes

\*This is an updated and revised version of an essay that appeared in *Democracy*, August 2009. We also draw on Johnson and Kwak (2010). For acknowledgments, sources of research support, and disclosure of the authors' material financial relationships, if any, please see <http://www.nber.org/chapters/c12450.ack>

1. On debit and credit cards, see the work of Adam Levitin, including Levitin (2007).

2. For more on what the legislation set out to do and its current status, see the epilogue to Johnson and Kwak (2011).

3. See Johnson and Kwak (2010), chaps. 4–7, which argues that the social costs are large.

4. See Johnson and Kwak (2010), chap. 7. This thinking was an important part of the motivation behind the Brown-Kaufman amendment to the Dodd-Frank legislation. The amendment failed on the floor of the Senate, 33–61.

5. Disclosure: I am a member of this committee.

6. Disclosure: I have been a member of the CBO's Panel of Economic Advisers since 2009, but I have not been involved in making these projections. All the numbers here are from the CBO's publicly available reports.

7. See also the May 2010 edition of the International Monetary Fund's cross-country fiscal monitor for comparable data from other industrialized countries (IMF 2010). The box on debt dynamics shows that mostly these are due to the recession; fiscal stimulus accounts for only 1/10 of the increase in debt in advanced G20 countries. Table 4 in that report compares government support for the financial sector across leading countries; the United States provided more capital injection (as a percentage of GDP) but lower guarantees relative to Europe.

## References

- Admati, Anat R., Peter M. DeMarzo, Martin R. Hellwig, and Paul Pfleiderer. 2010. "Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity Is Not Expensive." Working Paper no. 86, Rock Center for Corporate Governance at Stanford University; Research Paper no. 2065, Stanford Graduate School of Business, August. <https://gsbapps.stanford.edu/researchpapers/library/RP2065R1&86.pdf>.
- Avent, Ryan. 2009. "Squelching Innovation—Good or Bad?" *Portfolio.com*, April 17. <http://www.portfolio.com/views/blogs/market-movers/2009/04/17/squelching-innovation-good-or-bad>.
- Bernanke, Ben. 2007. "Regulation and Financial Innovation." Speech to the Federal Reserve Bank of Atlanta's 2007 Financial Markets Conference, Sea

- Island, GA, May 15. <http://www.federalreserve.gov/newsevents/speech/bernanke20070515a.htm>.
- . 2009. "Financial Innovation and Consumer Protection." Speech to the Federal Reserve System's Sixth Biennial Community Affairs Research Conference, Washington, DC, April 17. <http://www.federalreserve.gov/newsevents/speech/bernanke20090417a.htm>.
- Boot, Arnoud. 2011. "Banking at the Crossroads: How to Deal with Marketability and Complexity?" Working paper no. 2011-07, Amsterdam Center for Law and Economics. <http://www.accf.nl/uploads/aclewp2011-07%20Boot.pdf>.
- CBO (Congressional Budget Office). 2008. "The Budget and Economic Outlook: Fiscal Years 2008 to 2018." January. <http://cbo.gov/ftpdocs/89xx/doc8917/Frontmatter.1.3.shtml>.
- . 2010. "The Budget and Economic Outlook: Fiscal Years 2010 to 2020." January. <http://cbo.gov/ftpdocs/108xx/doc10871/Frontmatter.shtml>.
- Coval, Joshua, Jakub Jurek, and Erik Stafford. 2008. "The Economics of Structured Finance." Working paper no 09-060, Harvard Business School. <http://www.hbs.edu/research/pdf/09-060.pdf>.
- Daily Star. 2006. "First loan he gave was \$27 from own pocket." October 14. <http://www.thedailystar.net/2006/10/14/d6101401033.htm>.
- Duhigg, Charles, and Carter Dougherty. 2008. "From Midwest to M.T.A., Pain from Global Gamble." *New York Times*, November 1. <http://www.nytimes.com/2008/11/02/business/02global.html>.
- Ferguson, Niall. 2009. "Diminished Returns." *New York Times*, May 15. <http://www.nytimes.com/2009/05/17/magazine/17wwln-lede-t.html>.
- Haldane, Andrew, and Piergiorgio Alessandri. 2009. "Banking on the State." *Bank of International Settlements Review* 139/2009. <http://www.bis.org/review/r091111e.pdf>.
- IMF (International Monetary Fund). 2010. "Fiscal Monitor: Navigating the Fiscal Challenges Ahead." Washington, DC, May 14. <http://www.imf.org/external/pubs/ft/fm/2010/fm1001.pdf>.
- Institute of International Finance. 2010. "Interim Report on the Cumulative Impact on the Global Economy of Proposed Changes in the Banking Regulatory Framework." Washington, DC. [http://www.ebf-fbe.eu/uploads/10-Interim%20NCI\\_June2010\\_Web.pdf](http://www.ebf-fbe.eu/uploads/10-Interim%20NCI_June2010_Web.pdf).
- Johnson, Simon, and James Kwak. 2010. *13 Bankers: The Wall Street Takeover and the Next Financial Meltdown*. New York: Pantheon.
- . 2011. *13 Bankers: The Wall Street Takeover and the Next Financial Meltdown*. Reprint ed. New York: Vintage.
- Lerner, Josh, and Antoinette Schoar. 2010. *International Differences in Entrepreneurship*. Chicago: University of Chicago Press (for the NBER).
- Levitin, Adam. 2007. "Payment Wars: The Merchant-Bank Struggle for Control of Consumer Payment Systems." *Stanford Journal of Law, Business, and Finance* 12:425.
- . 2008. "A Critique of the American Bankers Association's Study on Credit Card Regulation." Georgetown Law and Economics Research Paper no. 1029191; Georgetown Public Law Research Paper no. 1029191. August 18. [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1029191](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1029191).
- Scheiber, Noam. 2011. "The Escape Artist: How Timothy Geithner Survived." *New Republic*, February 10. <http://www.tnr.com/article/economy/magazine/83176/timothy-geithner-treasury-secretary>.
- SIGTARP (Office of the Special Inspector General for the Troubled Asset Relief Program). 2011. "Quarterly Report to Congress." January 26. <http://www>

.sig tarp.gov/reports/congress/2011/January2011\_Quarterly\_Report\_to\_Congress.pdf.

Warren, Elizabeth. 2007. "Unsafe at Any Rate." *Democracy*, Summer. <http://www.democracyjournal.org/5/6528.php>.



